

DISEASES

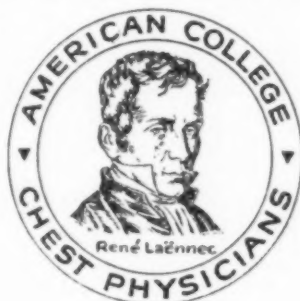
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Editorial Comment

The New Format of Diseases of the Chest

There can be little doubt that Fellows of the College will be pleased to know that the new format of Diseases of the Chest will begin with the January issue. This new journal will be larger, will be printed on a better grade of paper, will have more illustrations and will have a much more pleasing cover. Because of war conditions, the journal will appear as a bi-monthly publication instead of a monthly as heretofore.

Changes will be made in the Board of Associate Editors, and there is also in the process of organization a Board of Corresponding Editors, who will represent the College in our United States possessions, the Latin American countries and other countries where we have members residing.

The reorganization of the journal and a change in the editorial policy is justified by numerous letters which we have received commenting upon improvements in the journal and a desire for more scientific papers. This change in the official journal of the College was approved by the Board of Regents of the American College of Chest Physicians meeting in annual session at Atlantic City, New Jersey, June 8, 1942. Whereas, before, the prevailing

idea was to present articles which would be attractive to the general practitioner, the consensus of opinion now, and one which has been steadfastly increasing, is that the standards of the journal should be elevated and the material accepted for publication should be of more scientific value. At first, we were obliged to accept articles which were, more or less, of an elementary character. But now that we have an increasing amount of material from which to choose, we will select for publication articles which we feel are of merit and scientific value.

Obviously, the publication of the journal is going to be more costly, and the Editorial Board appeals to the Fellows of the College to give active support towards increasing its standards. It is particularly desirable that the Associate Fellows be encouraged to make contributions.

The Editorial Board wishes to express appreciation for the cooperation given by the Associate Fellows, Fellows of the College, and our advertisers, and wishes to take this occasion to extend the Season's Greetings to one and all.

Ralph C. Matson, M.D.,
Chairman Editorial Board

Tuberculous Tracheobronchitis*

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The importance of tracheobronchial tuberculosis received little attention until the last decade, in spite of the fact that Morton¹ wrote of an "asthmatical consumption" more than 200 years ago, describing a clinical picture that we recognize today as *bronchial tuberculosis with stenosis*.

Laennec² mentions bronchial tuberculosis, and while he concludes that it is a rare finding, points out that "it would perhaps be less so if we were more in the habit of examining the tracheobronchial tree carefully and minutely."

Despite these findings, bronchial tuberculosis has been recognized as a significant clinical entity only during the past ten years. The reason for this, no doubt, was failure to recognize the frequency of its occurrence. The diagnosis during life is made with the aid of bronchoscopy, a procedure which was not employed frequently after Chevalier Jackson³ pointed out in 1927 that only a few cases of tuberculosis of the lungs justified its use. At the present time the increased use of bronchoscopy in pulmonary tuberculosis, together with lipiodol bronchography, undoubtedly accounts for the increase in the frequency of the clinical diagnosis of tracheobronchial tuberculosis.

This paper is based on clinical observations and deductions made in a series of six cases of bronchial tuberculosis. Because of the relatively grave prognosis of this complication in its severer manifestations, it is important that clinicians recognize the complication.

Definition

The term "tuberculous tracheobronchitis" signifies a specific lesion of the trachea or major bronchi caused by the tubercle bacillus. The lesion may involve one or more of the layers forming the walls of the tracheobron-

chial tree, and includes all types of lesions, whether ulcerative or nonulcerative, hyperplastic or fibrostenotic. The term "major bronchi" is used as denoting both main bronchi and their primary divisions into lobar branches only, since tuberculosis of the smaller bronchi is considered an integral part of tuberculosis of the lung in the majority of instances.

Pathogenesis

The mode of infection is still debatable. Reichle and Frost,⁴ in a study of autopsy material, reach the conclusion that the most frequent avenue by which the bronchial mucosa becomes infected is along the mucous glands which extend from the mucosal surface to the peribronchial alveoli, lymphatics and lymph nodes. Tuberculosis seems to show a predilection for these glands which form a portal of entry past the barriers of cartilage, muscle and elastic tissue. Bugher, Littig and Culp,⁵ on the basis of 122 autopsies, concluded that the mode of infection was predominantly one of direct contact with bacilli-laden sputum, tubercle bacilli entering the walls either through ducts of the mucous glands or directly through the epithelium.

Infection may be by direct extension or spread of the tuberculous process from the edge of a cavity or other active pulmonary focus along the wall of the draining bronchus, in which case the mucous glands are not selectively chosen, but the pathological process infiltrates all tissues.

The possibility of infection of the tracheobronchial tree by haematogenous spread has not been the subject of detailed study and should not be overlooked.

The great majority of cases of bronchial tuberculosis seem to be secondary to an active or previously active pulmonary tuberculosis; however, primary tuberculosis of the bronchus seems quite possible.

Bronchial tuberculosis occurs chiefly as a complication of far-advanced pulmonary tuberculosis; however, several of our cases develop tuberculosis of the major bronchi with

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minimal parenchymal disease or with evidences of healing, and even with no manifest pulmonary tuberculosis.

Incidence

Tuberculosis of the bronchus is probably a more common complication of pulmonary tuberculosis than is laryngeal tuberculosis, and is often of greater significance since it may alter the course of the pulmonary disease more adversely than does tuberculous laryngitis. Bugher, Littig and Culp⁵ found in their autopsy series an incidence of 41 per cent. Warren, Hammond and Tuttle⁶ reported in a group of 90 patients at the Herman Kiefer Hospital and Maybury Sanatorium who had been advised to have thoracoplasty, an incidence of 13.3 per cent; likewise, in a group of 108 patients selected for bronchoscopy because they presented symptoms of bronchial disease an incidence of 57 per cent, that is, 37.4 per cent in the total of 198 cases. Hawkins⁷ reported an incidence of 25.6 per cent in 516 patients bronchoscoped at Olive View Sanatorium. More recently Myerson⁸ in a series of 572 consecutive bronchoscopies of tuberculous patients found an incidence of 26 per cent.

Clinical Classification

The study of tuberculous tracheobronchitis has led to a variable classification of lesions but all those described probably represent different stages in the same process. The simplest classification is that of Samson.^{9,10}

1) *Nonulcerative, nonstenotic group.* In this group the lesions seen bronchoscopically are submucosal infiltration and occasional discrete tubercles; the mucous membrane is reddened, rough and granular, and may bleed easily on instrumentation. This type of lesion may produce a soft stenosis.

2) *Hyperplastic or granulomatous lesions.* There is submucosal proliferation; conglomerate tubercles or tuberculoma may be seen. Sometimes tuberculoma appears as a pedunculated tumor which may or may not be entirely covered by unbroken mucosa. This type of lesion causes an alteration in the contour of the trachea or bronchi, often decreasing the diameter of their lumina.

3) *Ulcerative lesions.* Ulcers may be discrete, shallow, with smooth base and sides, or confluent and diffuse, with granulating base and rough, ragged edges. Occasionally the

ulcers extend to the cartilaginous ring.

4) *Fibrostenotic group.* Cicatricial narrowing of tracheal or bronchial lumen is probably the result of healing of an ulcerative lesion. The stenosis may be sharply localized; often an irregular scar tissue tunnel, one or more centimeters in length, is found.

5) *Ulcerostenotic type.* In many patients stenosis is accompanied by residual mucosal ulceration, with or without granulation tissue. This type represents an intermediate stage between 3 and 4.

Warren, Hammond and Tuttle⁶ found in some patients a diffuse hyperemia of the bronchial mucosa with moderate mucosal oedema. There are no clear-cut grounds for the assumption that this is a tuberculous lesion other than that in two patients the sputum was positive and each had no other demonstrable lesion to account for the tubercle bacilli. When these lesions cleared, the sputum became negative in each case.

Diagnosis

The clinical diagnosis is made on the basis of a careful history. In general, findings suggestive of tuberculous tracheobronchitis may be divided into subjective symptoms, physical signs, sputum changes and roentgenographic evidence. A combination of several of the signs and symptoms can be made the basis for a positive pre-bronchoscopic diagnosis of tuberculous tracheobronchitis in a high percentage of cases if the examiner keeps the possibility of this complication in mind.

The most common and constant symptom is audible wheezing or rattling, inspiratory or expiratory or both, usually persisting after all sputum has been raised. Some patients frequently suffer from paroxysms of coughing, with exceptional difficulty in raising sputum. Many patients complain of pain in the chest, pulling sensation, or inability to get deep breath. There are often dyspnea and intermittent cyanosis on slight exertion in spite of an apparently adequate vital capacity. Asthmatoïd attacks are frequent and these patients are frequently wrongly diagnosed as suffering from asthma or asthmatic bronchitis. McLeod Riggins¹¹ reports that as a result of the similarity of the clinical picture of asthma to that of bronchial tuberculosis and stenosis, 20 per cent of his cases of bronchial tuberculosis were erroneously diagnosed

previously as cases of bronchial asthma.

Several characteristics of the sputum in tracheobronchial tuberculosis are worthy of note. Considerable variation in the amount of sputum raised from day to day is indicative of partial obstruction. There may be excessively large amounts of sputum, which may be mucoid rather than purulent, for the degree of pulmonary tuberculosis visualized by x-ray. Sputum may be unusually tenacious and difficult to evacuate. The presence of a persistently positive sputum or even occasionally positive sputum in spite of an apparently quiescent parenchymal disease or in complete absence of parenchymal lesion has been, in our series of cases, a strong indication of bronchial tuberculosis. Fibrin plugs or mucous bronchial casts containing tubercle bacilli are of great diagnostic importance.

Occasionally, unexplained or capricious elevations of temperature in patients having an otherwise normal clinical course may be the first obvious sign of bronchial lesion sufficiently obstructive to cause a retention of secretions. The variations in the amount of sputum from day to day may coincide with the disappearance of fever.

Hemoptysis, in the absence of sufficient pulmonary disease to explain adequately the source, or where the control of parenchymal disease is adequate, is very suspicious of bronchial or tracheal ulcers.

Physical examination reveals certain typical signs. Sibilant and sonorous rales are heard over the lung involved and at times the rales are so loud that they are transmitted over both lungs. According to McConkey and Greenberg,¹² the presence of persistent audible and palpable parasternal bronchi is suggestive of obstructive lesions. They may be heard diffusely over the chest, but when localized the site of the lesion in the tracheobronchial tree may be predicted with reasonable accuracy.

Roentgenographic signs of tuberculous tracheobronchitis are not numerous, but they are important when present. X-ray evidence is nearly always based on stenosis or occlusion and perhaps the most frequently described finding is atelectasis. Intermittent areas of atelectasis in serial roentgenograms of the chest are considered significant of bronchial obstruction. The phenomenon of sudden disappearance and later reappearance of pul-

monary cavities which has been seen in some patients was probably also on the basis of intermittent bronchial obstruction.¹³ Sudden atelectasis after phrenic paralysis or following the induction of pneumothorax is very suggestive of obstructive lesions.

Fluctuant areas of infiltration and cases in which bronchogenic spread occurs without cavity or previous hemoptysis, cavities with persistent fluid level, cavities which fluctuate in size and those which increase in size or fail to close after otherwise successful pneumothorax, and cavities with extreme perifocal reaction should be investigated for possible presence of tuberculous tracheobronchitis.

The study of the bronchial tree by means of opaque fluid is of real benefit in certain cases: (a) When the bronchoscopic examination is negative in spite of strong clinical evidence of tuberculous tracheobronchitis, the instillation of lipiodol or diodrast may be employed to visualize stenosis "around the corner." (b) In all cases that show marked stenosis, because of the necessity to know exactly the length of the lesion. Narrowing of the bronchi is sometimes demonstrated in studies made with the Potter-Bucky.

Bronchoscopy

Positive diagnosis is dependent on bronchoscopic examinations and it is indicated in nearly all cases in which a diagnosis of tuberculous tracheobronchitis can be made or reasonably suspected by the clinician. This is specially true at the present time since the proper understanding and management of cases of bronchial and pulmonary tuberculosis make the diagnosis of the bronchial disease of the greatest importance. Contraindications are few and usually the condition demanding bronchoscopy overshadows the contraindications. The most frequently specific contraindications in tuberculous patients, aside from aneurysm, hypertension, cardiac failure and acute infectious diseases, are: advanced laryngeal ulceration, recent hemoptysis, and hopelessly advanced pulmonary tuberculosis. However, there is considerable evidence to support the claim that no harm results from careful bronchoscopy if contraindications are respected; and at the present time it is by far the most promising means to control a perplexing complication of a destructive disease.

The bronchoscopic appearance of the lesions

has been mentioned above. In differential diagnosis, nonspecific inflammations and ulceration, syphilis, neoplasms, etc., must be considered, but in general it is true that tuberculosis is by far the most frequent cause of lesions in the tracheobronchial tree during the course of pulmonary tuberculosis.^{6,7,10,11,12,13,14,15.}

Pulmonary Sequelae of Bronchial Lesions

When the bronchial lesion produces a marked stenosis a nonspecific infection due to the retention of secretions may be superimposed on the tuberculous pulmonary lesion. Consequently, nonspecific pneumonic and bronchopneumonic processes, abscesses, etc., can be observed, from which an exacerbation of the tuberculous disease often results. These changes generally take place in the area corresponding to the stenotic bronchus.

To these infectious sequelae, morphologic alterations of the pulmonary lesion itself may be added. Deserving special attention in certain cases is the behavior of cavities. A small cavity, surrounded or not by a distinct infiltration, can increase in size rapidly and unexpectedly. This phenomenon seems due to two main facts: (1) that the bronchial lesion produces a stenosis of such type that a check-valve mechanism permits free entry of air during inspiration but remarkably hinders its escape during expiration, thus giving rise to a high endocavitary pressure; and (2) that retention of secretions favors the multiplication of pus-producing germs and a consequent increased necrosis of lung tissue.

For the same reason, the cavities very frequently have a fluid level. Occasionally the cavity may become entirely filled with secretion, appearing then, instead of an area of greater transparency, a zone of homogeneous density, not very pronounced, which can be wrongly interpreted as a curative process. Nevertheless, be it due to the increase of the endocavitary pressure or because the bronchus becomes patent, or both, the patient can suddenly expel a great amount of expectoration and then the cavity will appear again.

Another of the sequelae of bronchial lesions is atelectasis in the pulmonary area corresponding to the affected bronchus. It is very seldom a simple atelectasis. The diseased bronchial mucosa loses its defensive function; consequently, great numbers of pyogenic bac-

teria are aspirated, from which develops infections that frequently are so serious as to carry the patient to his death.

Also caused by the same mechanism, but without added infection, emphysema of the obstructive type, either generalized or localized in a lobule, is observed in some patients.

From the preceding statements, the great number of possible pulmonary sequelae of bronchial lesions is obvious, also that they vary according to the different mechanical conditions of the bronchus and according to the bacteriologic composition of the aspirated or retained secretions.

Influence of the Bronchial Lesion in the Treatment of the Pulmonary Lesion, and Especially in Collapse Therapy

The tuberculous lesion of the bronchus may play a very important role in the treatment of the pulmonary lesion, and in many cases it makes treatment difficult and complicated. The problem of whether or not collapse therapy should be used in such cases is still a subject of controversy.

Not all the anatomicoclinical types of bronchial lesion have the same signification. The nonstenotic forms without ulceration or with only small and superficial ulcers shall be taken into consideration only as—and it is very important—the source of a persistently positive expectoration in cases in which the parenchymal lesion is well controlled or even apparently cured. Two cases reported by McLeod Riggins¹¹ will serve as examples. One of the patients presented a persistent positive sputum in spite of a minimal parenchymal lesion, and for that reason was submitted first to a phrenicectomy and later to a pneumothorax. The other case was a patient on whom an apparently effective two-stage thoracoplasty had been done, in spite of which expectoration persisted, and who then was submitted to the third and fourth stages of thoracoplasty. In both cases positive sputum persisted, for which they were later submitted to bronchoscopic examination. Tuberculous bronchial ulcerations were found in both of them, and by local treatments conversion of the sputum was obtained. The possibility of similar mistakes in certain cases with persistent positive sputum shows the enormous practical importance of the problem.

Bronchial lesions of the stenotic type con-

stitute an important factor in complicating collapse therapy because of their tendency to produce bronchial obstructions, thus giving rise to the sequelae discussed above.

The progress and success of collapse therapy have increased its application every day, and it is evident that frequently it is recommended and practiced in patients who present highly suspicious symptoms of bronchial lesion, either in spite of such suspicion or ignoring it. It is well known that no method of therapeutic collapse suffices to control the tracheo-bronchial tuberculosis in its serious, ulcerative stenotic form, because, once developed, it evolves independently of the parenchymal lesion.

It is important, therefore, that the phthisiologist as well as the thoracic surgeon know the effects that the bronchial lesion may have on the parenchymal lesion and on the collapse therapy. Many of the failures of collapse treatment are due to the presence of bronchial lesions which were not suspected when the collapse was begun. In cases of stenotic bronchial lesions collapse therapy seems to be contraindicated, or at least it should be postponed until adequate drainage from beyond the obstacle can be obtained, because collapse by any method provokes anatomical and functional changes which can increase the stenosis, make the drainage still more difficult, and thus cause pneumonic processes, aggravation of the parenchymal lesion, et cetera.

We do not mean to imply that all patients must be examined bronchoscopically before any collapse therapy is started, but we insist that two fundamental facts should be borne in mind always: (1) the relatively great frequency of the bronchial complications of pulmonary tuberculosis, and (2) the necessity of searching carefully for symptoms and radiological signs which may lead us to suspect the presence of a bronchial lesion. This is a matter of capital importance, especially in those cases which are going to be submitted to thoracoplasty, so that to the preoperative preparation of these cases a bronchoscopic exploration must be added as a part of the routine. If a bronchial lesion is discovered, it must be treated before operation, which will doubtless greatly improve the postoperative results. In the cases of ulcerative stenotic lesion which do not yield to treatment,

showing on the contrary a tendency to rapid progress, collapse therapy seems to be contraindicated. When cicatricial stenosis without ulceration is found, it is of great convenience for the surgeon to know its location and the nature and state of the stenosis; for in some cases dilatation and aspiration of secretions prior to operation may be useful.

Treatment

In regard to treatment, tracheobronchial tuberculosis may well be considered as a new clinical entity which, in most cases, is treated by the bronchoscopist. In discussing the general procedure, we are taking into consideration the fact that the value and results of different types of treatment that have been proposed are still open to discussion but are becoming better understood.

Antispasmodic and sedative medication, chemotherapy with gold salts, tuberculin therapy, massive doses of Vitamin C, etc., have only given, at best, slight and temporary relief. Neither has ultraviolet radiation given better results.

Roentgen therapy has also been employed, the authorities disagreeing as to its therapeutic indications and results. However, it seems to be contraindicated in the ulcerative types, especially if they are accompanied by much inflammation and oedema of the mucosa, because the reaction to irradiation increases these two conditions, thus provoking the very complication which we hope to avoid, namely, stenosis. Good results have been reported by some authors who used this treatment in cases of tuberculoma without any other accompanying lesion. We may presume that this type of lesion, which in some way has a pathological structure similar to that of the tuberculous lymph node and which is a well localized lesion on a very resistant ground, responds to roentgen therapy in the same way as tuberculous cervical lymph nodes.

Therefore, it is yet impossible to say anything definite about the beneficial or harmful effects of roentgen therapy until we have more experience. Nevertheless, even in ulcerative cases with inflammation and oedema of the mucosa, it seems logical to use it when there are reasons to believe that atelectasis induced by bronchial obstruction might be of benefit to the patient.¹³

The local treatment by means of broncho-

scopy is the one which seems, up to the present, to give best results. Three methods are the most used: (a) electrocoagulation; (b) cauterization by chemical solutions; and (c) surgical extirpation of the lesion. Each of these three methods seems to have a specific indication according to the type of lesion.

Electrocoagulation by means of Kernan's electrode^{16,17,18} gives very good results if in an expert's hand, as reported by Packard and Davison, but it is necessary to be very careful in using it, employing only current of very low intensity, avoiding the slightest possibility of producing necrosis. Thus, the electrode is never applied in the same place for more than five seconds, avoiding coagulation larger than 1 mm. deep. Not all of the tuberculous tissue should be destroyed, but rather, the natural restorative process should be simulated, because otherwise one risks perforation of the bronchus or development of stenotic cicatrices.

Cauterization with solutions of silver nitrate, trichloroacetic acid, etc., give excellent results, especially in the ulcerous types and in the granulomatous forms when they are very extensive, being, as far as we know, much less dangerous than electrocoagulation.

In cases of tuberculoma, many authorities recommend extirpation with biopsy forceps, cauterizing the base of implantation immediately with a silver nitrate solution or by electrocoagulation. If the tumor mass is very large, they advise not to remove it entirely in one session.

The fibrostenotic forms present a different problem in each case. When there are ulcerations, these must be treated first to avoid increasing the stenosis. When the stenosis is cicatricial without any ulceration, one must distinguish those which do not cause retention symptoms or any other disorders, nor require any intervention, from those which on the contrary cause retention of secretions with toxic manifestations or influence unfavorably the parenchymal lesion or the result of the collapse therapy. In such cases treatment is necessary. If the stenosis is in band form, one or several indentations may be made with the biopsy forceps, completing the treatment with sessions of dilatation and aspiration. In cases of very extensive stenosis, the procedure of dilatation is indicated. Most authorities recommend using for this

procedure bronchoscopes of different diameters instead of bougies, because they have over these the enormous advantage of not interrupting the aerial current, allowing the operator to see what he is doing, and at the same time making the aspiration of the secretions possible. One of our patients (see case 3) has a marked bronchial stenosis to such an extent that the caliber of the main right bronchus is almost filiform, provoking periodic crises of retention, which resolve by means of vomica, from which she has been suffering for many years and which only may be cured by dilatation of this stenosis which we will attempt soon, employing laminaria stems.

Case Reports

Case 1—A white female, aged 19. Her illness began early in 1939 with persistent cough, expectoration, fever, loss of weight and malaise. She had several treatments without results; in April, radiography and sputum examination were advised and the patient was referred to us by her physician.

The physical examination revealed a syndrome of asthmatic bronchitis. The x-ray showed some accentuation of the bronchial trunks in both lungs and slight, homogeneous veil of both apical zones. The sputum was positive for tubercle bacilli.

Subjected to complete rest for one month, the radiological signs disappeared, but cough, wheezing and positive sputum persisted.

Three months later, positive sputum persisted, but radiography did not show any evidence of parenchymal tuberculosis. As the patient suffered repeated asthmatic attacks and presented eosinophilia (7 per cent), we examined her from this angle and found her hypersensitive to house dust, horse dander, feathers, rice, wheat, chocolate, and codfish. The patient was treated as a case of bronchial asthma and the asthmatic attacks improved, but wheeze persisted in the upper part of the right lung. In September a new x-ray examination did not reveal any pathological signs; but positive sputum persisted.

A bronchial lesion was suspected and the patient was persuaded to be bronchoscoped. This was performed by Dr. C. Basterrechea with the following results: In the right main bronchus, 1 cm. below the tracheal bifurcation, an ulcero-granulomatous lesion was ob-

served, which bled easily and which partially occluded the bronchial lumen.

This was a case of tuberculosis of the right main bronchus, with a clinical asthmatoïd syndrome, persistently positive sputum and without any evidence of parenchymal lesion.

Five cauterizations with 5 per cent silver nitrate were practiced at seven-day intervals, with which the lesion completely healed, leaving practically no stenosis. At the same time, the asthmatoïd syndrome disappeared entirely and the sputum became negative. At the present, after more than two years, the patient is completely cured and has gained 33 pounds in weight.

Case 2—A negro female, aged 20. When 10 years old she had a diagnosis of pulmonary tuberculosis and was treated by artificial pneumothorax during one year. At the age of 15 she began to suffer from an asthmatoïd syndrome with persistent cough and slight expectoration which was negative for tubercle bacilli, and was treated as a case of bronchial asthma.

When the patient came to us, the physical examination revealed numerous rhonchi and scattered sibilant rales over the right lung but predominating in the upper half where they were easily palpable; x-ray showed no evidence of parenchymal lesion; sputum examinations were repeatedly negative.

On suspicion of a bronchial lesion, the patient was bronchoscoped by Dr. P. Hernandez with the following report: There was a congestive zone in the right main bronchus, apparently non-ulcerative, narrowing the bronchial lumen.

This was a case of a chronic infiltrative-stenotic tuberculosis of the right main bronchus without ulceration, manifested by a clinical asthmatoïd syndrome, with sputum persistently negative and without any apparent parenchymal lesion.

Three cauterizations with 5 per cent silver nitrate were practiced, with which the asthmatoïd syndrome disappeared.

Case 3—A white female, aged 21. Since the early infancy of her second child she suffered from cough accompanied occasionally by abundant sputum, mainly in the morning. Five years ago these symptoms became more severe and were accompanied by fever. At that time she attended a Tuberculosis Dispensary and there tuberculous lesion of the right

lung was diagnosed. Treatment by bed rest and gold therapy caused the fever to disappear; her general health improved, but the same syndrome persisted. In July, 1939, she was admitted to "La Esperanza" Sanatorium because of periodic, severe asthmatoïd attacks accompanied by high temperature, chills and symptoms of toxic absorption which lasted from 15 to 25 days, and ended, generally, rather abruptly with abundant expectoration in vomica form, sometimes with slight fetid odor. On admission, the x-ray presented an atelectatic process of the right upper lobe, with nodular shadows of distinct sizes disseminated over the remainder of the lung. She was bronchoscoped by Dr. G. Arrazuria and a diagnosis of suspected bronchial tuberculosis was made. Tubercle bacilli could not be found in any of the examinations, including culture of and guinea pig inoculation with material taken directly from the bronchus.

After she left the sanatorium, her symptoms recurred periodically every two or three months with the same characteristics, the patient feeling perfectly well during the intervals. In March, 1941, she came to us in one of the asymptomatic intervals. Physical examination did not show abnormal findings; the chest x-ray was interpreted as normal except for an elevation of the right diaphragm and a slight deviation of the mediastinum toward the right. Bronchoscopic examination performed by Dr. P. Hernandez showed the right main bronchus stenosed to such an extent that its caliber was almost filiform.

This was a case of fibrostenotic lesion of the right main bronchus without evidence of parenchymal lesion, with negative sputum, characterized clinically by a syndrome of periodic bronchial retention.

The treatment to be used in this case is dilatation of the bronchial stenosis.

Case 4—A negro female, aged 21. Her illness began early in 1939 with persistent cough and scanty yellowish, occasionally blood-tinged expectoration. With the same clinical picture, and having lost more than 20 pounds in weight, she came to us in February, 1940.

Physical examination revealed numerous rhonchi and wheeze, and discrete moist rales in the upper half of the left lung. Radiologically, it appeared to be a fibrotic lesion in the middle zone of the left lung. Sputum

was positive.

In view of the positive sputum, pneumothorax was instituted, producing a technically effective collapse; in spite of which positive sputum persisted, also the physical signs which increased to such an extent that they could easily be heard at a distance from the patient. Dr. P. Hernandez bronchoscoped the patient and his report is as follows: On the left main bronchus, about 4 cm. from the carina and occupying the right half, an ulcero-granulomatous lesion is observed, which is bleeding and partially obstructs the bronchial lumen.

This is a case of ulcero-granulomatous lesion of the left main bronchus, with a clinical asthmatoïd syndrome, positive sputum and radiological evidence of an apparently inactive lesion of the pulmonary parenchyma.

Local treatment with silver nitrate and trichloroacetic acid was practiced, with which the clinical syndrome disappeared completely; the sputum became negative and bronchial lesion was apparently healed without leaving stenosis. Pneumothorax was discontinued.

Case 5—A white female, aged 44. Her illness began in 1938 with cough, expectoration, accompanied by fever. Lately (May, 1939) she developed a good deal of wheezing perceptible to the patient herself in the parasternal area of the left lung, especially when she lies down on this side. At this date the patient came to us.

The physical examination revealed discrete moist rales in the upper third of the right lung; in the left lung intense rhonchi and wheeze were auscultated which disappeared when the patient, after violent attacks of cough, was able to expel some expectoration, generally very thick and in casts. Sputum was positive and x-ray showed an exudative-ulcerative lesion in the right upper zone and fibrotic lesion in the upper half of the left lung.

With bed rest and gold treatment, the patient improved rapidly, sputum became negative, the parenchyma is getting notably clear, but rhonchi and wheeze persist in the middle third of the left lung.

Bronchoscopy was performed by Dr. P. Hernandez with the following result: About 4 cm. from the tracheal carina on the left

main bronchus congested and granulomatous mucosa is observed with marked stenosis of the bronchial lumen.

This is a case of pulmonary tuberculosis, apparently healed, that presents a bronchial lesion of the hyperplastic type, without any apparent ulceration of the mucosa, and produces a stenosis. Sputum is negative.

Cauterization with 5 per cent silver nitrate was practiced, and the bronchial lesion was apparently healed.

Case 6—A white male, 28 years old. The patient's past history is a long one. During 4 years he was subjected to a bilateral pneumothorax, having been operated during that period for ileo-transversotomy because of tuberculous lesion of the ileo-cecal junction (Drs. Bergnes and Madariaga). After pneumothorax on the right side was discontinued, the patient began to complain of rhonchi in the right parasternal region, which we could not interpret then (1938) correctly. Shortly afterwards, the patient developed a non-tuberculous pneumonic process which activated the old tuberculous lesions. A cavity suddenly developed which underwent alterations of its size and showed, on some occasions, a fluid level. We tried to reestablish artificial pneumothorax, but it was impossible on account of pleural symphysis. Next, we practiced a right phrenicectomy and the lesions improved. In spite of it, positive sputum persisted and the patient complained of dyspnea and periodic crises of fever lasting several days and disappearing after the expulsion of abundant expectoration.

Suspecting a bronchial lesion, Dr. P. Hernandez bronchoscoped the patient. On the right main bronchus at about 4 cm. from the tracheal bifurcation an ulcero-granulomatous lesion was observed which partially obstructed the bronchial lumen.

Here was a case of ulcero-stenotic bronchial tuberculosis that had been wrongly interpreted for a long time. This lesion, when one day a temporary total obstruction of the bronchial lumen developed, was the cause of the pneumonic process, which, in turn, provoked reactivation of the tuberculous parenchymal lesions. The behavior of the cavity, as mentioned before, was due to transitory stages of more accentuated bronchial obstruction. We want to call attention to the fact that this patient never showed signs of atelectasis. This

case is still under treatment and observation.

From the six cases of bronchial tuberculosis here presented we note the following characteristics:

1) Five of the patients were female, i.e., 83 per cent.

2) In three of the patients (cases 1, 2 and 3), when the bronchial lesion was diagnosed, there was no evidence of parenchymal lesion. One of these had positive sputum. In case 4, in spite of positive sputum, there was a stationary fibrotic lesion, apparently healed. In case 5 there was an old exudative lesion, apparently cured, with negative sputum.

3) In four of the cases the lesion was localized in the right main bronchus.

4) In three cases the lesions were of the ulcero-granulomatous type. Two of them, that did not present stenosis, are actually healed.

5) Four of the patients presented a typical asthmatoïd syndrome, but all of them showed as the most important signs the persistent presence of localized rhonchi and wheeze.

Summary and Conclusions

The tuberculous lesions of the tracheobronchial tree, although having been known for more than a century, have not been studied adequately until the last ten years, when North American authors have shown the greatest interest in this disease entity.

These lesions are much more frequent than generally believed, and represent as much as about 20 per cent of the cases of pulmonary tuberculosis. In the great majority of cases they are secondary to a parenchymal lesion, but one which may be healed or at least arrested when bronchial lesions are diagnosed. On the other hand, cases of evident primary tuberculous lesions of the tracheobronchial tree have been described. It seems to be more frequent in females than in males.

Tuberculous tracheobronchitis is perhaps of more importance than laryngeal tuberculosis, because it alters the course and evolution, also the results of treatment of, the parenchymal lesions more harmfully than does the latter; as in its serious form of the ulcero-stenotic type bronchial tuberculosis causes about a 50 per cent mortality no matter what treatment may be exclusively used against the pulmonary lesion.

Only bronchoscopy can establish the diag-

nosis with certainty. Clinical and radiological symptoms and signs are only presumptive. Nevertheless, stenotic lesions can also be diagnosed by bronchography.

Parenchymal lesions do not contraindicate the bronchoscopic examination, except in very special cases. Complications are very rare. Biopsy seems to be contraindicated if the bronchial lesion is suspected to be of tuberculous nature.

In patients under treatment by any type of collapse therapy, the persistence of positive sputum in spite of an apparently effective treatment must lead us to suspect the presence of an ulcerative lesion of the bronchus, and in these cases, before deciding whether to increase or change the collapse, a bronchoscopic examination must be performed. The same can be said of those cases where positive sputum is present without any radiological signs of parenchymal lesion or with evidence of healing.

Many cases of bronchial tuberculosis have been mistakenly diagnosed and treated as asthma for a long time. We believe that if the cases described until recently as "asthma and tuberculosis" were to be studied in the light of our present knowledge, a complete revision of the subject would follow. We want to have it well understood that we do not deny the existence of "tuberculous asthma" and also that asthma and tuberculosis may coexist independently in the same patient; but we want to insist that many of the supposed asthmatics which become tuberculous are really cases of bronchial tuberculosis of chronic evolution without parenchymal lesion. Since in such cases the asthmatoïd syndrome predominates, the non-specialist physician is prone to neglect thorough study of the patient's respiratory tract because he considers them as genuine asthmatics. All asthmatics should be periodically studied radiologically, and no physician should content himself with a mere clinical examination.

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Trends in the Frequency and Type of Surgical Procedures in the Treatment of Pulmonary Tuberculosis*

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Authorities of more than a hundred Canadian and American tuberculosis sanatoria and hospitals made available a summary of their reports on the use of collapse therapy in their institutions for a full five-year period from January 1, 1937, to December 31, 1941. Leading chest surgeons also cooperated in this study.

The representative institutions selected for the survey, most of them with 300 or more beds, had a total census on December 31, last, of 33,225 patients. The observations have been classified separately for nine broad regions, as follows: Canada, New England, New York City, Upstate New York, New Jersey, Mid-Atlantic and Southern, Central Inland, Northern Midwest and Western. In almost every instance, in the United States, the tuberculosis institutions were utilized to capacity, the ratio of bed occupancy for the entire group being 97 per cent. The Canadian sanatoria, however, averaged 85 per cent, whereas the New York City group reported overcrowding and their ratio of occupancy rose to 112 per cent of normal capacity.

The average daily census of the institutions studied ranged between 30,580 and 32,596 adult

patients. It was first noted that at the present time the proportion of patients under some form of collapse therapy, which at the end of 1937 was 49 per cent, was practically stabilized during the five years reviewed, and that in 1941 it had varied by one point only, being now 48 per cent.

The proportion of patients under collapse therapy naturally was found to vary in different sections of the country, peaks having been reached in 1938 and 1939 when the group of New England institutions reported 63 per cent of all their adult patients undergoing some form of collapse therapy. The New York City group of institutions had on December 31, 1941, the lowest proportion of patients under collapse therapy, viz., 30 per cent.

The type of procedures reviewed were the more common ones: phrenic nerve operation, intrapleural or artificial pneumothorax, intrapleural pneumolysis, thoracoplasty, pneumoperitoneum, oleothorax, cavity drainage and lobectomy—all, except the last two, designed to give rest to the diseased lung.

Concerning artificial pneumothorax, the institutional authorities reported no less than 2,739,459 such treatments as given during the five-year period. The more serious thoracoplasty operation was performed in 23,435 instances.

In the ninety-nine institutions surveyed,

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the number of patients treated by either the ordinary hygienic-dietetic-rest method or by special treatments or surgery totaled altogether 74,295 in 1937 and 77,588 in 1941.

During the five-year period 1937-1941, there were 176,798 patients discharged alive, and 41,925 who died in the institutions, indicating

an average in-patient mortality ratio to total cases of 19 per cent for all sections of the country. In some regions, the ratio was as low as 13 per cent, and in one it rose to 26 per cent; New York City institutions experienced a 20 per cent mortality.

Boeck's Sarcoid*

(Report of a Case With Renal Involvement)

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Within the last few years there has been a considerable revival of interest in Boeck's Sarcoid. Articles dealing with this disease have been appearing with increasing frequency. Longcope¹² recently reviewed a series of thirty-one cases observed over a period of years; so it is evident that the disease can no longer be considered a rarity. Autopsies, particularly in cases which have received thorough clinical study, have been few, due to the benign character of the condition. A survey of the literature on sarcoid is made difficult because of the great variety of synonyms. A detailed list is given by Pinner in his exhaustive analysis of the literature. Among the more commonly used synonyms are, Lupus Pernio, Benign Miliary Lupoid, Benign Lymphogranulomatosis, Ostitis Tuberculosa Multiplex Cystoides, Maladie de Besnier-Boeck, Hutchinson-Boeck Disease, Non-Caseating Tuberculosis, and Chronic Miliary Tuberculosis.

In 1875 Hutchinson gave the first description of a case and named the disease Mortimer's Malady, after his patient. Important contributions to our knowledge of sarcoid have been made by Boeck, Besnier, Schaumann, Kissmeyer, Kienbock, Jungling, Longcope, Hunter, Harrell and Fisher, and Cohen and Rabinowitz. Exhaustive reviews of the literature have been made by Longcope,¹¹ Pinner,¹⁴ and Hanneson.²

The etiology of sarcoid is unknown. According to one body of opinion, it is an unusual,

benign form of tuberculosis. This is based on the histologic resemblance, the very occasional recovery of tubercle bacilli, and a few reported instances of termination in frank caseating tuberculosis. Schaumann has reported resolution of sarcoid lesions simultaneously with the development of a frank tuberculosis. However, in the vast majority of cases tubercle bacilli cannot be recovered by any method, and the tuberculin reaction is negative. At least two cases⁹ have been reported in which the administration of B. C. G. in large doses to cases of sarcoid failed to induce tuberculin reactivity. This latter phenomenon lends support to the theory that sarcoid is an atypical tuberculosis and that its unusual features are due to the lack of tuberculin allergy. It may be that sarcoid is due to some as yet unidentified virus or some other infectious agent. Williams and Nickerson¹⁸ have devised a skin test for sarcoid, analogous to the Frei test. At the present time none of the current theories can be considered established.

The sarcoid lesion typically consists of groups of miliary nodules of pale epithelioid cells. Compact clusters of these nodules are a constant feature no matter what type of tissue is involved. There is no peripheral inflammatory zone and caseation and necrosis are absent. Occasional giant cells are present and these may show peculiar inclusions which stain intensely with hematoxylin. The lymph nodes, skin, lungs, and bones are the most commonly involved, but no organ or tissue is exempt.

Sarcoid presents the features of a chronic infectious granuloma. The disease character-

*Read at a meeting of the Denver Sanatorium Association, January 27, 1942.

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istically pursues an indolent course, with periods of remission and relapse. Healing may occur. The onset is insidious, and usually takes place before the age of thirty. There is no special sex or race incidence. Constitutional symptoms may be very few, even when the disease is very widespread. Because of the varied order in which tissue involvement may occur the clinical picture may assume a variety of forms. The most common initial finding is enlargement of the superficial lymph nodes. Although skin lesions are common, wide dissemination of the disease may occur in its absence. Cough and weight loss are common, but fever is unusual. The white blood cell count usually shows a low or normal value with a shift to the left in the Schilling hemogram. Eosinophilia, monocytosis, and increased sedimentation rate may be present. The globulin fraction of the plasma protein is commonly elevated, often to a sufficient degree to raise the total plasma protein. A similar change in plasma globulin is said to occur in multiple myeloma, kala-azar, and lymphogranuloma venereum. Elevation of the serum calcium has been reported in a number of cases. Symptoms in sarcoid are apt to be lacking when the lesions, as in superficial lymph nodes or the skin, are so located as to preclude pressure effects. The opposite is true when involvement occurs in the eye, the mediastinum or, rarely, the heart or central nervous system. Lesions have been reported in almost every organ and tissue of the body. Disseminated miliary lupoid, resembling miliary tuberculosis, has been found at autopsy.

Skin lesions appear as patches of nodules, larger nodosities, or as diffuse infiltrations. They tend to show a violaceous color and are most commonly located on the face and scalp.

Lymph node involvement is most common in the preauricular, postauricular, submaxillary, and submental nodes. The enlargement may vary considerably in degree, may be localized or generalized. At times the lymph nodes may reach a very large size. They are firm, discrete, movable, and show no tenderness. The consistency is firm and rubbery. Clinical differentiation from the lymph node enlargements found in Hodgkin's Disease is said to be impossible. Sarcoid of the mediastinal and peribronchial lymph nodes is common.

The mucous membranes of the nose, nasopharynx, larynx, and conjunctivae may show lesions. Tonsillar disease is not uncommon. Uveo-parotid fever is considered to be a form of sarcoid. Enlargement of the spleen and liver has frequently been reported.

In the chest film the lungs may show a reticulated appearance similar to that found in miliary tuberculosis. Very commonly large dense shadows are found in the hilar regions, from which radiations extend to the bases along the medial aspects of the lower lobes. Dense shadows, presumably due to lymph node enlargement, may be found in the superior mediastinum. A remarkable feature of pulmonary sarcoid is the usual absence of symptoms or physical signs. The chest film in this disease may closely mimic tuberculosis, Hodgkin's Disease, and conditions responsible for extensive fibrosis. Pulmonary sarcoid lesions may resolve or fibrose. Fibrosis may be severe enough to result in right heart failure. There is a pronounced tendency for pulmonary lesions to clear, and the average time required for resolution is said by King⁶ to be 22 months. Recurrence of pulmonary lesions once clearing has taken place is said to be unusual. The chest film, however, is not a reliable prognostic guide.

Bone lesions are usually found only in the hands and feet. The x-ray shows areas of rarefaction and reticulation scattered through the medulla of the phalanges. Enlargement, or even painless mutilation of the fingers may occur. The periosteum and joints are not affected.

Arsenicals, leprosol, tuberculin, roentgen rays, and radium have been used in the treatment of this disease without effect. According to Longcope¹² ultraviolet light may have a favorable effect on the skin lesions and superficial lymph node enlargements. Effective treatment will not be available until something is known of the etiology and pathogenesis of the disease.

The following case was carefully studied for a period of almost a year. The complete absence of skin lesions, the paucity of superficial lymph node enlargements, and the presumptive evidence of sarcoid invasion of the kidneys, were interesting features. The presence of lesions in widely scattered organs and tissues served to emphasize the systemic nature of the disease.

B. K., a 24-year-old white male, was admitted to the National Jewish Hospital Jan. 22, 1941. He had been employed as a theatre manager and as a diamond setter. There was no familial or exposure history of tuberculosis. He was in good health until March, 1939, when he first noted persistent cough, purulent expectoration, high fever, and malaise. A diagnosis of pneumonia was made by his physician. The fever, cough, and expectoration required four weeks to clear up, but at the end of this period the patient was apparently completely recovered. He was well until October, 1939, when his symptoms recurred. The sputum was negative for tubercle bacilli. A chest film showed changes suggestive of Hodgkin's Disease. Intensive x-ray therapy was without effect. Biopsy of a barely palpable lymph node at the base of the left side of the neck in March, 1940, showed lesions considered consistent with sarcoid. The Mantoux test was negative. Numerous direct smears of the sputum for tubercle bacilli were negative. In October, 1940, patient began to vomit at frequent intervals, and this persisted up to the time of admission to this institution. Nocturia and occasional burning on micturition, apparently of fairly recent onset, were also present.

He was well developed but poorly nourished. The temperature was normal. There were no skin lesions. The left epitrochlear lymph node was palpable, but no other lymph node enlargements could be found. There was some longitudinal ridging of the nails. Examination of the chest gave only normal findings. Blood pressure was 154/115. No other abnormalities were in evidence on physical examination. The electrocardiogram showed definite right axis deviation. The sputum was scanty, mucoid in character. A blood count revealed hemoglobin, 9.6 gm.; red cells, 3.4 millions; white cells, 5700; neutrophils, 70 per cent mature, 4 per cent immature; lymphocytes, 17 per cent; monocytes, 5 per cent; eosinophiles, 4 per cent. The sedimentation rate (Westergren) was 25 mm. in the first hour. The urine showed two plus albumin, small numbers of white cells and occasional granular and hyaline casts. Blood chemistry showed sugar 95 mgm. per cent, nonprotein nitrogen 61 mgm. per cent. The Kolmer and Kahn blood reactions were negative. Vital capacity was 2.7 litres, 61 per cent of normal. The

Mantoux test was negative up to and including 10 mgm. of old tuberculin. The patient also gave a negative reaction to 1 mgm. of bovine tuberculin. The potency of the old tuberculin was verified by tests on known positive reactors.

Two cultures and two guinea pig inoculation of sputum for tubercle bacilli were negative. X-ray of the chest revealed characteristic changes (Fig. 1). Roentgenograms of the hands and feet and of the long bones were negative. The left epitrochlear lymph node was removed for section. Typical sarcoid lesions were found (Fig. 2). An acid-fast stain of a section of this node showed no organisms. Half of the excised node was ground up and injected into a guinea pig. When killed at the end of three months, the animal failed to show any lesions.

The patient's persistent vomiting subsided within a few months after admission. A gain in weight and strength and a rise in hemoglobin followed. The icterus index and the Van den Bergh tests were within normal limits. Serum calcium was 10.2 mgm., serum phosphorus 3.1 mgm. The test for amyloidosis showed only 37 per cent absorption of the dye at the end of one hour. Urine concentra-



Figure 1—X-ray of the chest, showing large dense hilar shadows, a dense, sharply circumscribed superior mediastinal opacity, and diffuse fine mottling or "reticulation" of the lung fields.

tion remained fixed at a low level and the nonprotein nitrogen rose to above 70 mgm. per cent. Only 9 per cent of the dye was recovered from the urine in the phenolsulphonphthalein test. The blood pressure remained persistently elevated and showed little change. The plasma protein varied from 3.9 gm. to 6.1 gm. and the albumin: globulin ratio from 2.8:1 to 1:1.2. The globulin was less diminished than the albumin and on one occasion rose to 3 gm. Oedema was not observed. In April, 1941, a slight reduction in size of the superior mediastinal shadow was observed in the chest film. In June, 1941, another film showed a return to the admission status and thereafter additional films failed to show any change. In May, 1941, difficulty in voiding was first experienced and this soon became extreme. Cystoscopy revealed an obstructive mass in the region of the bladder neck. A transurethral resection relieved the difficulty. Histologic examination of the resected tissue showed only diffuse glandular hyperplasia. There was no evidence of sarcoid lesions. In September, 1941, cough recurred and was accompanied by pain in the left chest. On bronchoscopy no tracheal or bronchial lesions were found. Nausea and vomiting soon recurred and were followed by severe weight loss. Roentgen examination of the gastrointestinal tract in September, 1941, showed a constant deformity as well as poor filling of the duodenal bulb. A marked six hour gastroduodenal residue was present. The presence of a peptic ulcer was suspected. In October,

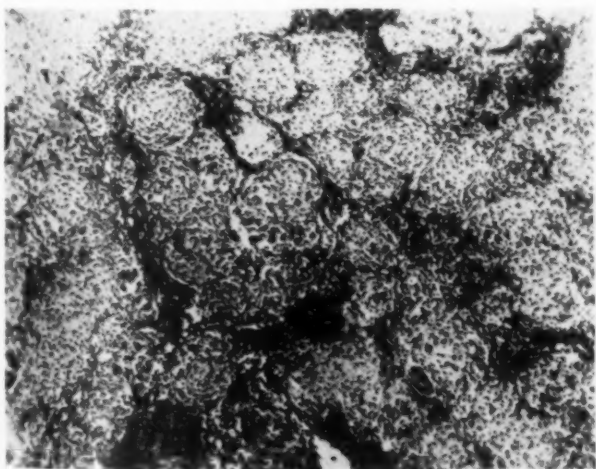


Figure 2—Low power view of the section of the left epitrochlear lymph node, showing compact nodules of epithelioid cells, and an occasional giant cell. The dark-staining collections of lymphocytes constitute a residuum of normal tissue, rather than an inflammatory exudate.

1941, the spleen became definitely palpable. Additional electrocardiograms showed a persistence of the right axis deviation, as well as a prolongation of the P-R interval and inversion of the T waves in the fourth lead.

Our only attempt at treatment consisted in the administration of large doses of old tuberculin intracutaneously. From ten to twenty mgm. was given twice weekly for a period of eight weeks without noticeable effect on either the symptoms or the appearance of the chest films. The patient left the hospital of his own accord in December, 1941.

Comment—The diagnosis of sarcoid was verified by biopsy and by the negative tuberculin reactivity. Pulmonary tuberculosis was excluded by intensive study of the sputum. Clinical study afforded evidence suggestive of involvement of the bronchial, superior mediastinal and superficial lymph nodes, the lungs, kidneys, and spleen. The renal insufficiency and hypertension may well have been on the basis of a sarcoid invasion of the kidneys. Renal involvement of such severity is conceded by most to be an exceptional development in this disease. Although sarcoid of the prostate was suspected, histologic examination of the resected tissue afforded no proof. The superficial lymph node enlargements were insignificant, yet showed the typical lesions. Schaumann's observation of sarcoid lesions in lymph nodes of normal size is of interest in this connection. Elevation of the plasma globulin and electrocardiographic evidence of right heart strain were additional features of interest. There were no skin lesions.

Although the diagnosis of sarcoid usually denotes a fairly good prognosis, we feel that the outlook for this patient is poor because of the severe and progressing renal insufficiency. In some cases which have been reported, invasion of the brain or of the myocardium has led to a fatal outcome. A considerable variety of clinical syndromes has been described in this disease. This is due to the fact that involvement of various tissues or organs may occur in almost innumerable sequences and combinations.

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Tuberculin Testing in High Schools: Its Educational and Preventive Value

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In recent years the tuberculin skin test has become an important factor in the campaign against tuberculosis. The test has been criticized, as a case-finding procedure, the claim being made that relatively few cases of active tuberculosis are discovered by the method of tuberculin testing and x-raying of the positive reactors. This is quite true, and if evaluated from the standpoint of case-finding alone, the tuberculin testing program would be very expensive and not nearly as effective as some other methods.

The value of the tuberculin testing program also depends greatly upon the type of community in which the work is carried on. In congested city districts, or in other localities, where the percentage of positive reactors to the tuberculin test is more than one-third of the total number tested, it is generally conceded that mass x-raying of the entire group to be investigated is preferable to doing the preliminary tuberculin tests and then x-raying all the positive reactors. In smaller towns and rural communities, however, where the percentage of positive reactors to the skin test is around 15 per cent or lower, the procedure of doing the tests first, to be followed by chest films of the positive re-

actors, is still a feasible and effective method, particularly from the educational and preventive standpoints.

If the tuberculin testing program is carried on primarily for its educational and preventive value, then the educational element in the program should, of course, be emphasized. Thorough preliminary work should be done in each high school a short time before the date for the actual testing itself. This preliminary program usually includes the following:

- 1) A general talk on tuberculosis before the student body by a trained tuberculosis worker.
- 2) Showing of one or more films that give dependable information concerning tuberculosis and its prevention.
- 3) Having each student fill out a brief questionnaire, giving information as to his past health record and also whether or not he has had any definite contact with tuberculosis.
- 4) Having each student take home a mimeographed sheet which explains briefly to the parents the purpose and value of the tuberculin test. This sheet has at the bottom a consent slip which the parent signs, and this written consent of the parent is turned in at school by the pupil before the tests are given.

In doing the actual testing, we do not place emphasis on mere speed in getting the tests done, but take time to answer any questions brought up by the students and also to explain different points as we go along. This is supplemented by the giving of additional information when we read the tests. We now have a small mimeographed sheet—one for positive reactors and another for those who are negative to the test—giving a brief explanation concerning the reaction to the test, and one of these explanatory sheets is sent home to the parent in the case of every student tested.

Following the reading of the tests, which is done approximately forty-eight hours after the tests are given, the physician has a personal interview with each student who had a positive reaction to the test. This includes a chest examination, as well as a brief check-up of the general physical condition—teeth, throat, general nutrition, etc. The main objective, however, in having the interview, is to explain to the individual student somewhat more in detail the significance of a positive reaction to the tuberculin test; to urge these young people to follow good general health habits; to advise them to have an x-ray film of the chest to be sure the lungs are approximately normal; and also to stress the importance of re-examinations (including x-ray of the chest) at reasonable intervals in succeeding years. Also, the school nurse, or the public health nurse makes a home call wherever a boy or girl has had a positive reaction to the tuberculin test and gives information to parents in regard to the significance of a positive reaction. Those negative to the skin tests and this means about 85 per cent of those tested in small towns and rural communities in the State of Washington are advised to have the test repeated at least every other year until the individual is twenty years of age or older. This is on the assumption, of course, that the test remains negative.

If a tuberculin-testing program is carried on along the general lines indicated above, we feel that it is a very valuable procedure and one that should be of great help to this group of young people who in a few years will be heads of families and the home-makers in our various communities. These individuals should not only be able to apply this knowl-

edge in the prevention of tuberculosis in their immediate families, but also be a source of dependable information concerning tuberculosis and its prevention for neighbors and others in the community.

The tuberculin-testing program under consideration here was started in the fall of 1931, so covers a period of approximately ten years. The great majority of the tests have been made with old tuberculin in the medium dilution of 1 to 1,000. Two strengths of purified protein derivative have been used in a few localities and for a total of something over 1,500 tests. The tests done with medium-strength old tuberculin (1 to 1,000 dilution) were made only once, not being repeated with a stronger dilution. We have felt that from the educational standpoint it is more effective to test 10,000 students once than to test 6,000 with a weak solution and then have to re-test some 5,000 of the same people (about 85 per cent negative reactors). There is, of course, some element of error in doing the tests only once with a medium-strength solution; but an individual who actually has an active tuberculous lesion should, in the great majority of cases, react positively to this medium-strength dilution of old tuberculin. It is taken for granted that the solution used in making the tests is freshly prepared, the full-strength tuberculin secured from a dependable source, the test carefully done and accurately interpreted.

It should be very definitely and frankly stated that this single-dose method of doing the Mantoux tuberculin test is not as accurate and dependable as the two-dose method. In institutions such as colleges, universities, nurses' training schools, etc., where time and personnel are available for the additional testing, the two-dose method is decidedly preferable and should be employed. It is also true that the incidence of clinical tuberculosis is somewhat greater among these young adults than in high school groups, so the testing of these older people should be as accurate as possible.

On the other hand, in the report of the Sub-Committee on Case-Finding in Tuberculosis¹ of the American Public Health Association, this committee states:

"In the meantime it should be noted that the great majority of all patients with clinically significant tuberculosis as defined above,

react not only to all well-known types of tuberculin, including both purified protein derivative and the well-known brands of old tuberculin, but to small doses of any of them."

There has been a slow, but definite, decline in the percentage of positive reactors during the past ten years. The results for different periods are as follows:

	Tests	Positive	Per cent Positive
Sept., 1931, to April, 1935	17,191	2,356	13.7
May, 1935, to May, 1938	15,929	1,890	11.86
June, 1938, to May, 1941	17,509	1,759	10.04
Total	50,629	6,005	11.85

It will be noted that the drop in percentage of positive reactors from 1935 to 1938 was 1.84 per cent, while the decrease from 1938 to 1941 was 1.82 per cent.

It should be remembered that no city children are included in these groups. Tests in Seattle, Spokane and Tacoma have been done by the tuberculosis organizations and local health authorities in those cities.

As a comparison, the results among younger children (junior high and lower grades) might be of interest. During the past ten years the following results have been noted:

	Tests	Positive	Per cent Positive
Sept., 1931, to April, 1935	8,026	867	10.8
May, 1935, to May, 1938	13,156	1,065	8.09
June, 1938, to May, 1941	15,967	889	5.56
Total	37,149	2,821	7.59

During the ten-year period a total of 4,497 college students were tested, with 874, or 19.43 per cent, positive. Teachers given the tuberculin test during the same ten years totalled 3,904, with 1,470 positive, or 37.65 per cent of the number tested.

Comparison of these four different age groups shows very definitely the increase in percentage of positive reactors with increase in age of the group tested.

It is well known that the incidence of clinical tuberculosis among students of high school age is very small. Doctor Henry Chadwick² of Massachusetts reports the testing of 60,000 pupils in Middlesex County over a five-year period. Positive reactors averaged 20 per cent, or a total of approximately 12,000 positive to the tuberculin skin test. Only one in 1,500 pupils tested were found to have active

tuberculosis (40 cases). Crimm,³ of Evansville, Indiana, tested 12,353 high school students over a period of eight years, using old tuberculin up to a dilution of 1 to 100. Of this group, 18 per cent were positive to the tuberculin test, but only 0.1 of 1 per cent had active pulmonary tuberculosis. Doctor Chadwick stated that the tuberculin tests could be used most advantageously as a screening process in schools and colleges where the percentage of positive reactors is less than 30 per cent. He also felt that every high school pupil should be examined for evidence of tuberculosis once during the pupil's high school course.

We have not had the necessary personnel to carry on a systematic follow-up, in later years, of these boys and girls who were positive to the tuberculin test while in high school. The co-operation of school nurses, county public health nurses, health officers and family physicians has been utilized as much as possible in getting periodic re-examinations for these young people. There has been a certain small percentage of cases, of course, that have broken down with active tuberculosis, either while in high school or in succeeding years. Our general observation, however, has been that the number of active cases developing in this group has been very small, and we feel that the likelihood of a physical breakdown because of active pulmonary tuberculosis will be very definitely lessened among these positive reactors as a result of the educational work carried on in connection with the tuberculin-testing program in the high schools. As indicated above, the home call made by the public health nurse helps toward making clear to the parents the significance of a positive reaction to the tuberculin test, and usually enlists the co-operation of the parents in trying to keep these young people in good health.

The tuberculin test should be considered as only one of the various procedures utilized in case-finding. It must, of course, be supplemented by other measures such as careful history of the case, observation and examination by the physician, x-ray of the chest, and, in many cases, examination of the sputum for the possible presence of tubercle bacilli. Considered from its educational and preventive aspects, however, we feel that the tuberculin-testing program among high

school pupils and young adults, if properly presented, carefully done, and with as thorough follow-up as possible, is a procedure in tuberculosis control that is worthy of continuation and expansion.

919 Terminal Sales Bldg.

References

- 1 From: "A Manual of Tuberculosis Case-Finding," National Tuberculosis Association, p. 24, 1940.
- 2 Chadwick, Henry: From Massachusetts Tuberculosis League Bulletin, December, 1940.
- 3 Crimm, Paul D.: "An Evaluation of Tuberculin Test and Correlating Roentgenograms," *Dis. of the Chest*, 7: 378 (Nov.) 1941.

Report of the Council on Sanatorium Standards and Administration American College of Chest Physicians 1941-1942

The Council on Sanatorium Standards and Administration is charged with certain duties which among other duties included (1) To study and evaluate the needs for efficient care and treatment of patients in the tuberculosis sanatoria of this country and of other countries, and (2) To be specifically concerned with such problems which will tend to advance the standards of the aforementioned institutions.

To accomplish this purpose, the council felt that it would be advisable to make a study of the present personnel ratios in the sanatoria, and, if possible, to make certain recommendations for minimum standards for personnel, and also to make a preliminary study of certain aspects of the medical care of the patients in these sanatoria. To accomplish this end, the council prepared a questionnaire, a copy of which was sent to the majority of the sanatoria throughout the United States. Replies were received from 150 sanatoria located in 38 different states of the Union. As a result of this survey, the council believes that because of the wide existing differences in personnel ratios and because of the great variation in the recommendations for standard ratios for personnel that further detailed study is needed before specific recommendations can be made for adoption by the American College of Chest Physicians.

As a result of this survey, we were able to establish certain averages from those now in existence and from the ratios recommended to arrive at a general average for the following personnel:

Ratio of	Present	Recommended
Ward physicians to patients	1 to 62.7	1 to 50.7
Nurses to patients	1 to 10.6	1 to 8.7
If major surgery is done		1 to 5.8
Ward attendants to patients	1 to 11	1 to 9.8
Dietary personnel to patients (incl. dietitians and cooks)	1 to 12	1 to 11
Social workers to patients	1 to 191.3	1 to 132
Occupational therapists to patients	1 to 153	1 to 118
Medical technicians to patients	1 to 132	1 to 130
X-ray technicians to patients	1 to 184	1 to 188

There were only thirty-three sanatoria that reported having a full-time roentgenologist on the staff. The majority of the sanatoria reporting recommended the services of a full-time or part-time roentgenologist depending upon the size of the institution, the availability of a roentgenologist and the financial situation of the sanatorium involved. There were, however, fifty-six sanatoria that did not feel that the services of even a part-time roentgenologist was necessary. Approximately half of these fifty-six institutions were of less than 100 beds.

There were only twenty-eight sanatoria that reported that at present they had the services of a full-time pathologist. The majority of the reporting sanatoria did not feel that the services of a full-time or part-time pathologist were necessary, provided specimens could be sent to an approved state laboratory or other approved laboratory. If such services were not available, the majority of the sanatoria felt that the part-time services

of a pathologist would be desirable.

The question of the interval of time to routinely re-x-ray patients was almost universally set at three months. It was recommended that the chronic cases should be re-x-rayed from three to six months, and at the present time that is the general procedure in most of the sanatoria that all of the patients are routinely re-x-rayed anywhere from three to six months. So far as fluoroscopic examinations are concerned, no certain time can be stated. The majority felt that fluoroscopy should be used when indicated but should be used particularly preceding pneumothorax re-fills.

Laboratory procedures universally recommended were complete hemogram including red blood cell count, hemoglobin determination, white blood cell count and differential; routine and concentrated sputum examinations monthly; determination of sedimentation rate; serological examination for syphilis; examination of the gastric contents for tubercle bacilli in patients with negative concentrated sputum specimens.

The vast majority of the reporting sanatoria recommended that major thoracic surgery should be done at the sanatorium, if satisfactory arrangements could be made to carry this out. Most of the sanatoria not in favor of thoracic surgery were the smaller institutions where the volume of work would not be great and where it would not be feasible to have the proper set-up for this procedure. The general feeling was that approximately 300 beds or over would be necessary to provide a sufficient volume of work to make it feasible to do the surgery at the sanatorium and to have the proper set-up to carry out this procedure. Practically all of the sanatoria recommending carrying on thoracic surgery in the sanatorium felt that the ideal set-up would be to have the services of a full-time thoracic surgeon. However, it is felt that this should not necessarily be recommended as a universal procedure because in many instances, even in large sanatoria, it appears more practical to have the surgery done by a visiting surgeon rather than by a resident surgeon.

The question was raised as to whether or not patients suffering from pulmonary lesions other than tuberculosis should be admitted to the tuberculosis sanatorium. The great ma-

jority of reporting sanatoria recommended that any type of pulmonary lesion could be admitted for study to the tuberculosis sanatorium. This pertained only to cases where the diagnosis was in doubt as it was felt that probably a tuberculosis sanatorium would have better facilities for carrying out such studies than the average general hospital. Certain sanatoria at the present time do accept non-tuberculous pulmonary infections such as bronchiectasis, carcinoma of the lung, lung abscess and fungus diseases. The majority of the sanatoria, however, did not feel that the tuberculosis sanatorium should be open to the treatment of these cases as a routine procedure.

The greater number of institutions now doing thoracic surgery have a department of anesthesia but practically none of these institutions have a full-time anesthetist on the staff. Practically all of the institutions accomplish this work by a visiting anesthetist or by a resident member of the staff under the supervision of the thoracic surgeon.

Practically all sanatoria have some form of health program and health examinations for their employees. Practically every sanatorium x-rays all new employees and the majority of the sanatoria include this as part of a general physical examination. Nearly all sanatoria re-x-ray all employees at least once a year and the majority re-x-ray those in contact with patients once every six months. The majority of institutions give some form of lectures or instructions to employees on how to protect their own health.

Recommendation

On the basis of facts developed by the Council on Sanatorium Standards and Administration, it is recommended that the functions of this council be continued and that further detailed studies be made before specific recommendations are presented to the American College of Chest Physicians for adoption.

Respectfully submitted,

Daniel Leo Finucane, M.D., *Chairman*
Henry A. Gorman, M.D., *Pennsylvania*
Bascom L. Chipley, M.D., *South Carolina*
Charles L. Ianne, M.D., *California*
Frederick Slyfield, M.D., *Washington*

*Form Letter Mailed to the Superintendents
of Sanatoria*

Address
Date

The Superintendent,
Sanatorium,
Address.

Dear Sir:

The American College of Chest Physicians, through its Council on Sanatorium Standards and Administration, is making a survey of the tuberculosis sanatoria of the United States to study and evaluate the needs for efficient care and treatment of patients. You are asked to fill in the following questionnaire and return it at your earliest convenience. This report will be published at a later date for the information of all concerned.

In answering the questions pertaining to ratio of personnel to patients, it is requested that you give the ratio now existing in your sanatorium and what you would consider an ideal ratio.

- I. a. Ratio of ward physicians to patients:
Present _____ Recommended _____
- b. Ratio of nurses to patients:
Present _____ Recommended _____
- c. Ratio of ward attendants to patients (including nurses' aides, maids, cleaners and orderlies):
Present _____ Recommended _____
- d. Ratio of dietary personnel to patients (including dietitians, cooks, mess attendants and all personnel assigned exclusively to diet kitchens in various locations):
(Do not include orderlies who carry trays)
Present _____ Recommended _____
- e. Ratio of social workers to patients:
Present _____ Recommended _____
- f. Ratio of occupational therapists to patients:
Present _____ Recommended _____
- g. Ratio of medical technicians to patients:
Present _____ Recommended _____
- h. Ratio of x-ray technicians to patients:
Present _____ Recommended _____
- II. Do you have a full-time roentgenologist on your staff? Yes _____ or No _____. If not, state recommendations: _____
- III. Do you have a full-time pathologist in charge of your laboratory? Yes _____ or No _____. If not, state recommendations: _____
- IV. a. How frequently should patients be x-rayed as a routine procedure while in the

sanatorium?

b. How frequently are patients x-rayed routinely at your sanatorium? _____

c. How frequently are patients fluoroscoped at your sanatorium? _____

V. What routine laboratory procedures are considered absolutely essential? _____

IV. a. Do you recommend doing all major thoracic surgery at the sanatorium? _____

Yes _____ or No _____

b. Do you believe that a full-time thoracic surgeon on the staff is necessary to properly carry out this work? _____

Yes _____ or No _____

c. If you believe that the surgery should be done at the sanatorium, do you recommend that more nurses be employed than in cases where surgery is not done at the sanatorium? Yes _____ or No _____. If so, what would be your recommended ratios? With major surgery _____ Without _____

VII. a. Do you recommend the admission to the tuberculosis sanatorium of patients with pulmonary lesions that are non-tuberculous? Yes _____ or No _____

b. Do you admit patients for conditions other than tuberculosis? Yes _____ or No _____

c. What non-tuberculous diseases are accepted, if any? _____

VIII. a. Do you have a department of anesthesia? Yes _____ or No _____

b. Do you have a full-time anesthetist in charge? Yes _____ or No _____

c. If answer "b." is no, who is in charge? _____

IX. What regulations do you have to protect the health of employees? Do you have a health program for employees? Please describe _____

X. a. Please state whether sanatorium is operated by State _____, County _____, Municipal Government _____, Church _____, Lodge _____, Private or other _____

b. Number of beds in your institution _____

c. Daily average number of patients calendar year 1941 _____

Please return this form as soon as possible to the undersigned.

Very truly yours,

Name _____

Member, Council on Sanatorium Standards and Administration.

Exigency of War

Oleum Percomorphum 50% is now known as Oleum Percomorphum 50% with Viosterol. The potency remains the same; namely, 60,000 vitamin A units and 8,500 vitamin D units per gram. It consists of the liver oils of percomorph fishes, viosterol, and fish liver oils, a source of vitamins A and D in which not less

than 50% of the vitamin content is derived from the liver oils of percomorph fishes (principally *Xiphias gladius*, *Pneumatophorus* *diego*, *Thunnus thynnus*, *Stereolepis gigas*, and closely allied species).

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Evansville, Ind., U. S. A.

Financial Report of the
American College of Chest Physicians

Report of Examination

FISCAL YEAR ENDED APRIL 30, 1942

LA SALLE AUDIT COMPANY

ACCOUNTANTS AND AUDITORS

205 WEST WACKER DRIVE

CHICAGO

May 14, 1942

American College of Chest Physicians
500 North Dearborn Street
Chicago, Illinois

Gentlemen:

We have made an examination of the books and records of the American College of Chest Physicians for the fiscal year ended April 30, 1942, and we are submitting herewith the following statements:

Balance Sheet—April 30, 1942

Statement of Income and Expenses—

Fiscal Year Ended April 30, 1942

The net income for the year amounted to \$4,913.12, as set forth in detail in the Statement of Income and Expenses.

We verified the cash on hand by actual count and by an examination of the petty cash vouchers.

The cash in bank was verified by a reconciliation of the book balance with the amount shown on the statement received from the First National Bank of Chicago.

Following is a summary of the cash transactions for the fiscal year ended April 30, 1942:

Balance April 30, 1941	\$ 7,598.83
------------------------	-------------

Cash Receipts:

New Membership Fees	\$ 5,700.00	
Dues—Net	11,830.50	
Collections Toward Fellowships	3,145.00	
Chapter Funds Collected	116.00	

TOTAL CASH RECEIVED		20,791.50
---------------------	--	-----------

TOTAL CASH AVAILABLE		\$ 28,390.33
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Cash Disbursements:

Expenses	\$ 12,617.38	
Purchase of Furniture and Fixtures	222.84	

TOTAL CASH DISBURSEMENTS		12,840.22
--------------------------	--	-----------

BALANCE APRIL 30, 1942		\$ 15,550.11
------------------------	--	--------------

1942

DISEASES OF THE CHEST

STATEMENT OF INCOME AND EXPENSES

YEAR ENDED APRIL 30, 1942

Income:

New Membership Fees	\$ 5,700.00	
Dues	11,830.50	
TOTAL INCOME		\$ 17,530.50

Expenses:

Subscriptions ("Diseases of the Chest")	\$ 2,073.50	
Salaries	3,784.25	
Meeting Expense	1,131.97	
Officers and Committee Expense	469.56	
Chairman—Board of Regents	360.00	
Chairman—Board of Directors	240.00	
Membership Certificates	283.00	
Rent	720.00	
Telephone and Telegraph	328.93	
Postage and Express	1,131.98	
Printing and Engraving	1,404.92	
Office Expense	458.87	
Attorney's Fees	175.00	
Bank Charges	55.40	
TOTAL EXPENSES		\$ 12,617.38
NET INCOME FOR YEAR		\$ 4,913.12

COMPARISON OF BUDGETED EXPENDITURES WITH ACTUAL EXPENDITURES

MAY 1, 1941, TO APRIL 30, 1942

Budgeted Expenditures:

	Budget	Actual
Office Rent	\$ 720.00	\$ 720.00
Telephone and Telegraph	300.00	328.93
Furniture and Fixtures	250.00	222.84
Salaries	3,900.00	3,784.25
Printing and Engraving	1,500.00	1,404.92
Postage and Shipping	1,200.00	1,131.98
Membership Certificates	150.00	283.00
Officers and Committee Expense	500.00	469.56
Chairman—Board of Regents	360.00	360.00
Chairman—Board of Editors	240.00	240.00
Subscriptions to "Diseases of the Chest"	2,000.00	2,073.50
Meeting Expense	1,000.00	1,131.97
Office Expense	500.00	458.87
	\$ 12,620.00	\$12,609.82

Expenditures Not Budgeted:

Attorney's Fees	\$ 175.00
Bank Charges	55.40
TOTAL EXPENDITURES	\$ 12,840.22

DISEASES OF THE CHEST
BALANCE SHEET--APRIL 30, 1942

DECEMBER

ASSETS

Current Assets:

Cash in Bank	\$15,550.11
Cash on Hand	10.00

TOTAL CURRENT ASSETS

\$ 15,560.11

Fixed Assets:

Furniture and Fixtures

885.34

TOTAL ASSETS

\$ 16,445.45

LIABILITIES AND NET WORTH

Liabilities:

Collections Towards Fellowships	\$ 1,945.00
Fellowship Fees Collected (Pending Examination)	1,850.00
Chapter Funds	211.00

TOTAL LIABILITIES

\$ 4,006.00

Net Worth:

Balance April 30, 1941	\$ 7,526.33
Net Income for Year	4,913.12

Balance April 30, 1942

\$ 12,439.45

TOTAL LIABILITIES AND NET WORTH

\$ 16,445.45

The furniture and fixtures are shown on the Balance Sheet at cost.

The partial payments collected toward Fellowships and the Fellowship fees collected pending examination are shown among the liabilities on the Balance Sheet.

The net worth of the organization has increased in the amount of \$4,913.12, which represents the net income for the year.

CERTIFICATE

We hereby certify that we made an examination of all cash transactions of the American College of Chest Physicians for the fiscal year ended April 30, 1942. We have examined or tested accounting records and other supporting evidence by methods and to the extent we deemed appropriate.

In our opinion, the accompanying Balance Sheet and related statements of income and expenses, together with our comments contained in this report, present fairly the financial position of the American College of Chest Physicians at April 30, 1942, and the results from operations for the fiscal year ended on that date.

Respectfully Submitted,

LaSALLE AUDIT COMPANY

Eugene Kuhn

Certified Public Accountant

Organization News

THE NEW DIRECTORY OF THE COLLEGE

The new directory of the American College of Chest Physicians has gone to press. The directory contains listings of 1254 members of the College from the United States of America, Alaska, Hawaii, Philippine Islands, Puerto Rico, Argentina, Australia, Brazil, Canada, China, Cuba, Dominican Republic, Ecuador, India, Norway, Peru, Republic of Panama, South Africa, and Uruguay. This is an increase of 351 members since the publication of the last directory in 1941.

In addition to the roster of membership, the directory will contain the Articles of Incorporation and the new By-Laws enacted at the last annual meeting of the College held at Atlantic City, June 6-8, 1942.

A list of the national officers and the officers of the State and District Chapters of the College will also be listed in the directory.

Copies of the directory should be ready for the mails by December 20th.

STATE TUBERCULOSIS COMMITTEES APPOINTED

The National Council of Tuberculosis Committees announces the appointment of the following tuberculosis committees as official bodies of their respective state medical societies.

Colorado

L. W. Frank, Denver, Chairman
R. S. Liggett, Denver
J. B. Crouch, Colorado Springs

Florida

Dr. William C. Blake, Tampa, Chairman
Dr. E. C. Brunner, Miami
Dr. J. Maxey Dell, Jr., Gainesville
Dr. Duncan T. McEwan, Orlando
Dr. Robert G. Nobles, Pensacola

Georgia

Dr. C. C. Aven, Atlanta, Chairman
Dr. Champneys H. Holmes, Atlanta
Dr. Enoch Calloway, LaGrange
Dr. H. C. Schenck, Atlanta
Dr. C. D. Whelchel, Gainesville
Dr. W. C. Cook, Columbus
Dr. R. F. McGahee, Augusta
Dr. E. F. Wahl, Thomasville

Dr. R. V. Martin, Savannah

Dr. C. M. Sharp, Alto

Dr. H. C. Atkinson, Macon

Dr. Warren Gilbert, Rome

Kansas

Dr. C. H. Lerrigo, Topeka, Chairman
Dr. A. L. Ashmore, Wichita
Dr. Harold R. Barnes, Hutchinson
Dr. F. C. Beelman, Topeka
Dr. I. R. Burket, Ashland
Dr. Guy A. Finney, Topeka
Dr. Homer L. Hiebert, Topeka
Dr. R. G. Klein, Dodge City
Dr. Ellis B. McKnight, Alma
Dr. W. N. Mundell, Hutchinson
Dr. N. C. Nash, Wichita
Dr. J. W. Spearing, Parsons
Dr. C. F. Taylor, Norton
Dr. F. A. Trump, Ottawa

Maine

Dr. Edward A. Greco, Portland, Chairman
Dr. Loren F. Carter, Presque Isle
Dr. Lester A. Adams, Hebron
Dr. George E. Young, Skowhegan
Dr. James W. Laughlin, Newcastle
Dr. Norman E. Cobb, Calais
Dr. Francis J. Welch, Portland

Missouri

Dr. E. E. Glenn, Springfield, Chairman
Dr. Geo. D. Kettelkamp, Koch
Dr. J. A. Stocker, Mt. Vernon

Nebraska

John F. Allen, Omaha, Chairman
E. W. Hancock, Lincoln
Harvey D. Runty, Dewitt

Tennessee

Dr. W. S. Rude, Ridgewood, Chairman
Dr. C. M. Oberschmidt, Memphis
Dr. J. L. Hamilton, Chattanooga
Dr. R. R. Crowe, Nashville

Texas

Dr. Alvis Greer, Houston, Chairman
Dr. Tom Jones, Houston
Dr. H. F. Carman, Dallas
Dr. Erle Sellers, Abilene
Dr. Z. T. Scott, Austin

Note: Chairmen and other members of the College serving on state tuberculosis committees are urged to send the names of the members of the committees to the Executive Offices of the College at Chicago.

ERRATUM NOTICE

The November issue of our Journal erroneously carried a by-line on page 348 to the effect that the photographs as shown on that page were furnished to us through the courtesy of the American College of Physicians. We desire to correct this to read that the photographs of Drs. Samuel Dixon, Lawrence Flick, and H. R. M. Landis were furnished to us through the courtesy of the *Library of the College of Physicians of Philadelphia*.—Ed.

BODY MECHANICS IN HEALTH AND DISEASE. By Joel E. Goldthwait, M.D., F.A.C.S., LL.D., Lloyd T. Brown, M.D., F.A.C.S., Loring T. Swaim, M.D., John G. Kuhns, M.D., F.A.C.S., with a chapter on the Heart and Circulation as Related to Body Mechanics by William J. Kerr, M.D., F.A.C.P. Third edition. J. B. Lippincott Company.

As infections come under control the expectancy of life increases and this brings us into another phase of medicine, geriatrics.

How can we prevent or relieve illness in people who are growing older? Saving nervous wear and tear, surely; eating and sleeping more sensibly, surely; preventing fatigue from overwork, surely. These do not complete the possible approaches by any means and this book presents another method of prolonging a useful productive life. Correct body mechanics is presented in an interesting and informative fashion and methods of correction are given in detail. Even perusal of this book will add to a physician's understanding and treatment of many disorders and thoughtful consideration of the contents will add immensely to his therapeutic stature. The chapter by Kerr on "Angina Pectoris and Postural Emphysema Related to Obesity" is especially intriguing and the thoughts brought out in this chapter should be widely read and utilized.

Charles P. Hilson.

Quick, Effective Pan-Vitamin Therapy REQUIRES HIGH POTENCY

For Rapid Restoration of Vitamin Balance

A-B-C-D-G

RECOMMENDED

- In convalescence from pneumonia and influenza.
- In treatment of tuberculosis, fevers, infections.
- Preoperative preparation and postoperative convalescence.
- Pregnancy and lactation.



Wasting and depleting diseases drain vitamin reserves, retard convalescence and may multiply operative risks with co-complicative avitaminoses. To correct vitamin imbalance rapidly and effectively, prescribe VICAP-FORTIOR. Each capsule is a light-proofed, hermetically sealed unit of high-potency multi-vitamins A-B-C-D and G, including the B-Complex. Administered by single capsule, it does not complicate other medication.

A comparative inspection with other vitamin formulae will lead you to prescribe VICAP-FORTIOR.

WRITE FOR LITERATURE

BIOCHEMICAL RESEARCH LABORATORIES, 1525 E. 53rd St., Chicago, Ill.

DOCTOR!

Each Capsule Contains Not Less Than:	
Vitamin A	20,000 Units
Vitamin B ₁	2,000 Micrograms
Vitamin B ₂	1,000 "
Ca. Pantothenate	250 "
Pyridoxin	500 "
Nicotinamide	15 Milligrams
Vitamin C	500 Units
Vitamin D	2,000 Units

In Bottles of 30-60-100 Capsules

VICAP-FORTIOR

BIO

CLINICAL HEART DISEASE, Second Edition, by Samuel A. Levine, M.D., F.A.C.P., Assistant Professor of Medicine, Harvard Medical School; Senior Associate in Medicine, Peter Bent Brigham Hospital, Boston. W. B. Saunders Co., 1940. Pp. 495, illustrations 109.

The author states in the preface of *Clinical Heart Disease* that his purpose is to write a text of value to the general practitioner. From this standpoint the book may be considered a singular success. This result has been achieved by basing the approach to the diagnosis, prognosis, and treatment of heart disease on the history and on the simple fundamentals of observation and examination.

The laboratory aids in the diagnosis and treatment of heart disease are mentioned, but are not stressed. The section on Electrocardiography is restricted to a discussion of changes of well recognized and accepted significance. The emphasis on the limitations of Electrocardiography is timely.

Doctor Levine has taken a very practical attitude toward the subjects discussed. This is typified by his remarks on the importance of giving a guarded prognosis in heart disease. The uncertainties of heart disease make a wrong prognosis not unlikely with resultant damaging effects to the reputation of the prognosticator.

The book expresses the personal opinions of the author as formulated by him from his years of clinical experience, and is not merely a correlation of generally accepted views. It is only natural that others should disagree with him on various points. This in no way detracts from the value of the discussion, but, on the contrary, is one of its chief virtues.

This book should be of value to medical students, as well as to general practitioners.

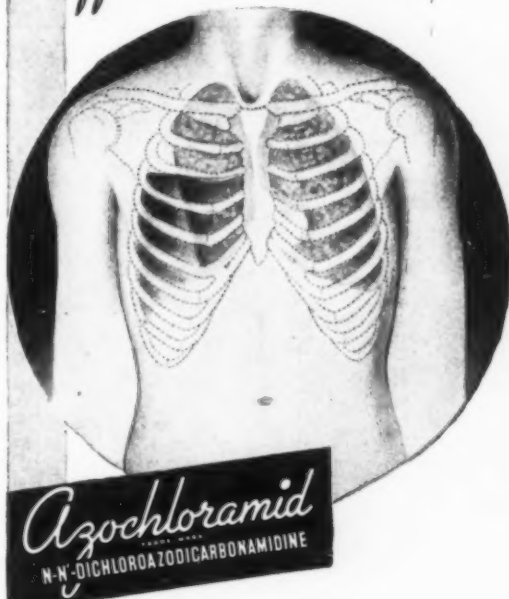
Charles N. Holman, M.D.

POSITIONS AVAILABLE

Assistant Physician. Some experience in diagnosis and treatment of tuberculosis. A physician able to work part time would be acceptable. Salary to start \$250.00 per month. Send full particulars and photograph to Dr. Frank Walton Burge, 1930 Chestnut Street, Philadelphia, Pa.

Assistant Physician. Sanatorium located close to Chicago. A physician interested in a residency in tuberculosis would be considered. Moderate salary to start. For particulars, address: Box 101A, American College of Chest Physicians, 500 North Dearborn Street, Chicago, Illinois.

Effective in treating
EMPHYSEMA



Suitable for either irrigation or instillation.

Pronounced stability in the presence of pleural fluid exceeds that of other chlorine germicides.

Reduced frequency of application.
Easily prepared—Economical.

**AZOCHLORAMID IS COUNCIL
ACCEPTED**

SUPPLIED AS:

Azochloramid Saline Mixture for instant preparation of an isotonic solution 1:3300 buffered to pH 7.4.

Now available in a New Economical Hospital Bulk Package. Details on request.

Azochloramid Solution in Triacetin 1:500, an oily solution which is used undiluted.

Azochloramid Solution in Triacetin 1:125 to prepare a solution in Olive Oil 1:2000.

Trial quantities sent to physicians on request.

WALLACE & TIERNAN PRODUCTS, Inc.
Belleville, New Jersey, U. S. A.

VOLUME VIII.

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- 3-ALLERGIC COUGH (April, P. 115)
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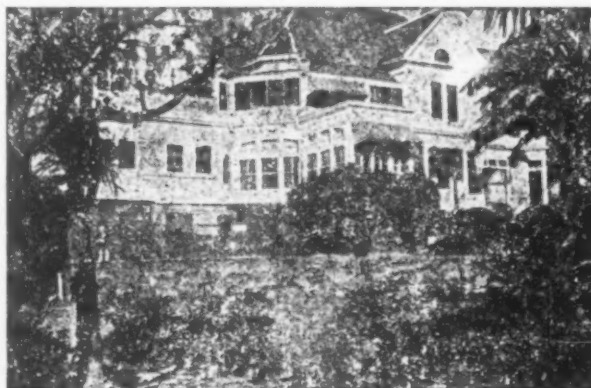
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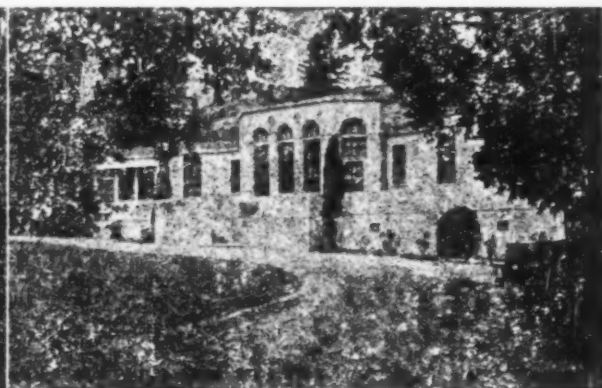
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